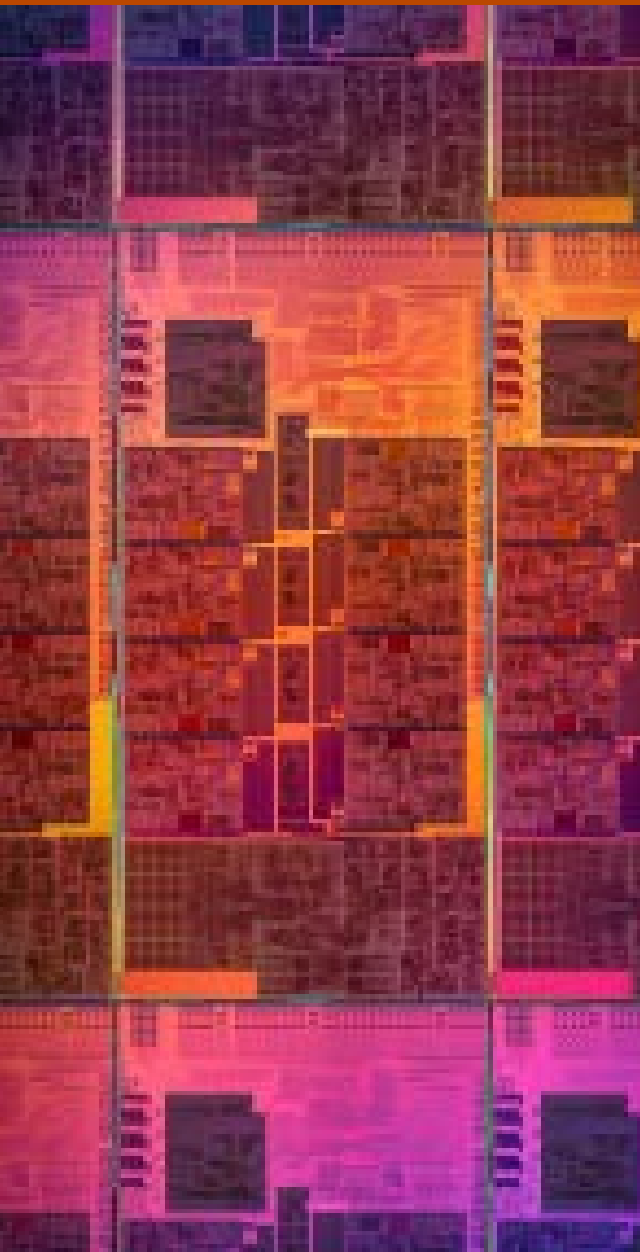


SUPERTECH RESEARCH GROUP



The Supertech Research Group investigates scalable fast code and its hardware, software, and algorithmic foundations.



Group Leads

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Location:
The Supertech Research Group is located in the Ray and Maria Stata Center at MIT

Research Group Address:
Supertech Research Group
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32 Vassar Street
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Research Vision

We aim to make computing simple, fast, scalable, and sustainable. Our group assists domain experts in developing large-scale multicore applications, focusing on large and irregular problems that arise in graph analysis, machine learning, and scientific simulations. We develop compilers and other software tools to simplify the development of efficient multicore programs. We also investigate technology trends and study the foundations of algorithms and data structures.

Areas of Research

- Software performance engineering
- Multicore systems and parallel programming
- Algorithms and theory
- Compilers and parallel runtime systems
- Fast AI and machine learning
- Economic implications of technology trends

Research Activities

- Sustainability of machine learning and data science
- Compilers for optimizing parallel programs on multicore machines
- Fundamentals of algorithms and data structures
- Software productivity tools for fast code and parallel computing
- Performance engineering of AI and machine learning
- Cache-efficient parallel algorithms
- Analysis of large-scale trends in computing and AI

$$T_1 / T_\infty$$

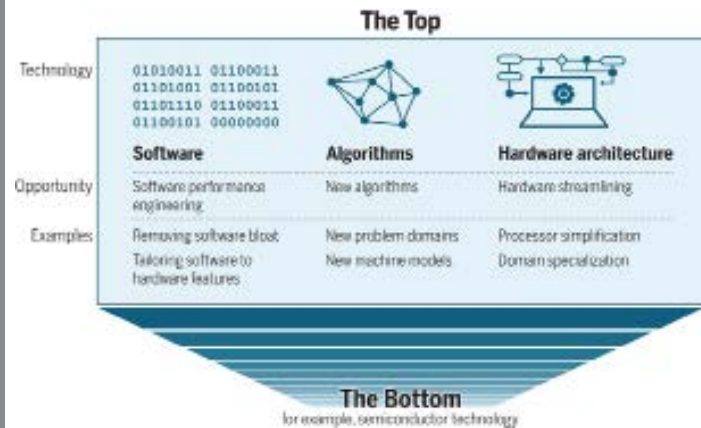
Advancing computing T_1 / T_∞ steps at a time

In the News

- After the end of Moore's Law, we will need more efficient software, new algorithms, and specialized hardware, say [MIT CSAIL researchers](#).
- The [OpenCilk 1.0](#) task-parallel computing platform contains a novel compiler which optimizes parallel code better than any commercial or open-source compiler.
- Professor Leiserson's textbook [Introduction to Algorithms](#) has sold over 1 million copies.

"Practically all industries depend on computing innovations, which historically have been driven by ever-increasing hardware performance, while software performance has languished. For the pace of innovations to continue in the post-Moore's Law era, mainstream software must drive performance. The future demands fast code."

— **Tao B. Schardl**



Industry Applications

- Graph analysis, AI, and machine learning
- Large-scale scientific simulations
- Strategic business and technical planning for AI and multicore computing
- Scalable computing systems

Current People in the Supertech Research Group

Principal Investigators

Charles E. Leiserson
Neil Thompson
Tao B. Schardl

Postdocs and PhD Students

Nuruddin Ahmed
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